Spotted Wing Drosophila Trap Network 2013

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Spotted wing Drosophila (SWD) was first detected in New York in 2011 and, in 2012, was reported from across the state causing significant damage to berry crops. For 2013, a coordinated approach was taken in the collection and delivery of SWD information to fruit growers, as well as home gardeners. An SWD website was launched at www.fruit.cornell.edu/spottedwing/ containing webpages on SWD hosts, monitoring, identification, management, distribution, impact, and biology; a blog at blogs.cornell.edu/swd1/ was started that currently has 51 subscribers; quick reference tables of labeled insecticides for at-risk fruit crops were developed; and a home gardener SWD fact sheet was written.

Because SWD was considered to be established throughout NY, efforts were undertaken to monitor and report first trap catch. Nineteen scientists at Cornell University, in Cornell Cooperative Extension County Associations and Regional Programs set out vinegar and yeast baited traps in 29 counties (Table 1) and reported trap catch data to the Eastern SWD Volunteer Monitoring Network mapping system, www.eddmaps.org/project/project.cfm?proj=9.

Table 1. Collaborators in the spotted wing Drosophila trap network, the New York Counties where monitoring took place and the crops in which traps were located. At most locations traps were situated within the crop and on the crop edge or in the hedgerow or adjacent woods.

Name	Counties	Crops
Agnello	Ontario, Wayne	Cherry
Armata	Herkimer	Raspberry
Bachman	Erie	Raspberry, blueberry
Breth	Monroe, Niagara, Orleans	Raspberry, blueberry, blackberry
Carlberg	Chautauqua	Raspberry
Carroll	Cayuga, Niagara, Onondaga, Orleans, Schuyler, Wayne	Raspberry, blueberry, strawberry, cherry
Cook	Dutchess, Ulster	Raspberry, blueberry, strawberry
Fargione	Columbia, Ulster	Cherry
Hetzler	St. Lawrence	Blueberry, currant
Ivy	Clinton	Blueberry
Jentsch	Orange	Raspberry
Loeb	Ontario, Schuyler, Seneca, Tompkins, Wayne, Yates	Raspberry, blueberry, blackberry, strawberry, stone fruit
Loeck	Tioga	Raspberry
McDermott	Albany, Columbia, Rensselaer, Saratoga, Washington	Raspberry, blueberry, blackberry, strawberry
Mehlenbacher	Steuben	Blueberry
Miller	Oneida	Strawberry
O'Connell	Ulster	Blackberry
Thorp	Livingston	Raspberry
Zaman	Suffolk	Raspberry, blueberry, blackberry, grape, peach, apple

The SWD trap network data was used to generate a NY distribution map (Figure 1). Data was collected and input to the distribution map for 140 trap locations. Cornell Cooperative Extension personnel that participated in the trap network alerted growers to protect their crops when SWD was found in their area. On average, SWD was first trapped in NY at about the same time as in 2012, though peak activity seemed to occur later in 2013 than in 2012. This may have spared early maturing berries and lessened fruit damage to late maturing varieties of fruit.

Traps were made from red or clear cups containing an apple cider vinegar drowning solution. Inside the trap, a smaller cup containing a bait mixture of bread yeast, whole wheat flour and sucrose in water either floated in the vinegar or was fastened above it. Traps are described at

www.fruit.cornell.edu/spottedwing/pdfs/SWDTraps_CornellFruit.pdf . Traps were placed within the crop, on the edge of the crop, or in the adjacent wild hedgerow or woods (Table 1). Traps were checked weekly until sustained trap capture or until the crop was harvested, after which point they were removed. First reports were posted on the SWD blog with accumulated GDD (base 50) and day length calculated for the location. Weather data for GDD was obtained from the nearest station in the Network for Environment and Weather Applications (NEWA) newa.cornell.edu.

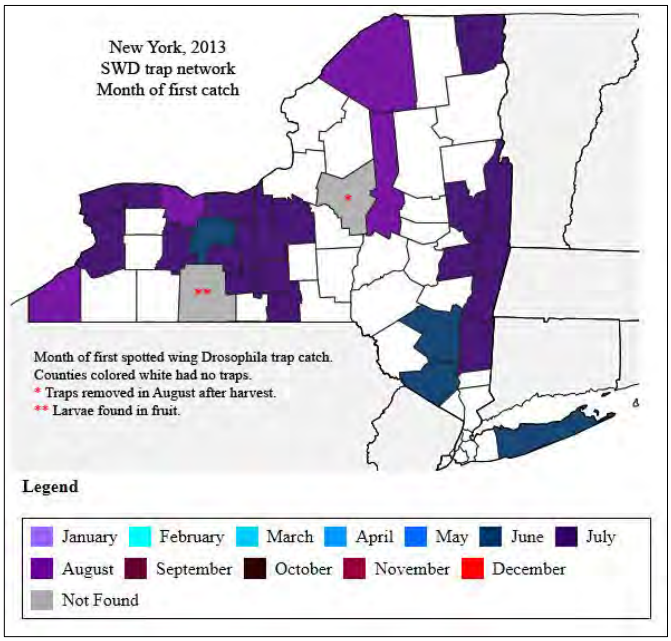

Figure 1. Four counties reported first trap catch in June (dark blue), 19 counties reported first trap catch in July (dark purple), and four counties reported first trap catch in August (light purple). Two counties did not find SWD in traps (gray).

The most common landscape location for the earliest trap catches in NY was in the crop edge or the wild edge. However, at many of these locations, trap catch was not sustained and one or more weeks with no SWD captures often followed the initial first catch. These early catch data are tabulated in Table 2. The earliest trap catch in NY was in Ontario County in the Finger Lakes region on June 11, although SWD was not caught again until six weeks later at this location. Early trap captures were most often found in traps that were in the crop edge, and they contained one to a few SWD that were typically female.

First sustained trap catch in New York State was found in the lower Hudson Valley (Orange County) on June 17th and the latest first sustained trap catch was found in northwestern NY (Niagara County) on August 28th. The average date for first sustained trap catch was July 25th. Growing degree days, base 50° F, (GDD) was determined for first catch and sustained trap catch and charted against date (Figure 2). On average, sustained trap catch date occurred on July 25 at 1497 GDD.

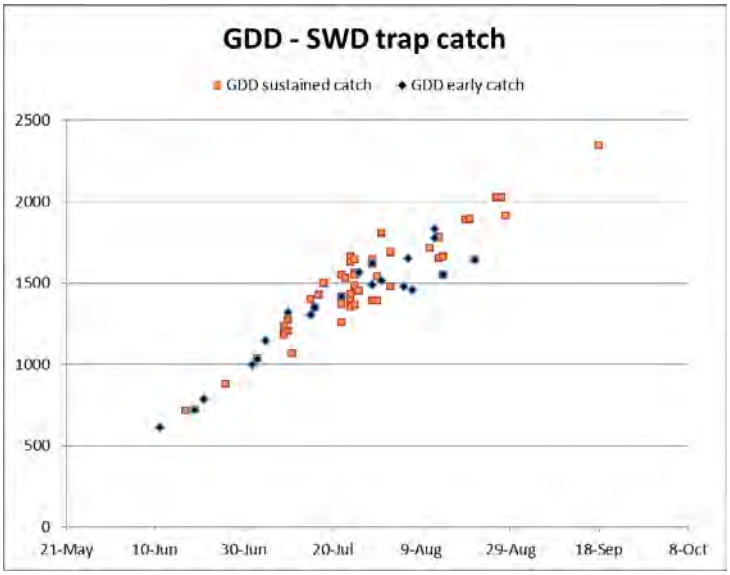

Figure 2. Growing degree days (GDD) as a function of sustained trap catch date found in the trap network. Average first sustained trap catch was July 25th with an average accumulated GDD of 1497.

Traps that were placed in June strawberries and monitored until after harvest typically did not catch SWD. At some locations, traps that were set in blueberries failed to catch SWD, but

larvae were found in fruit. Grapes suffered low to no damage, though SWD oviposition was observed in intact berries. A sweet cherry orchard in the lower Hudson Valley suffered significant fruit infestation, though sweet cherry in the upper Hudson Valley and Western NY escaped damage. Infestations were noted in day-neutral strawberries. Crops most heavily damaged were fall raspberries and blackberries. The earliest fruit-bearing, wild host identified to date is honeysuckle, *Lonicera tartarica*, a common invasive shrub in NY.

Figure 3. SWD male on blueberry, photo posted on the blog, blogs.cornell.edu/swd1/2013/09/05/swd-easily-found-now/.

Most berry crops grown in NY are for U-pick or direct markets. Insecticide applications appear to have provided acceptable levels of control in 2013, even in cases where only two early applications were made as fruit were beginning to ripen. Concentrating U-pick customers in berry plantings to aid in clean-picking was cited by some growers as an effective tactic in SWD management. The occurrence of only one susceptible fruit crop on a farm may also have an effect in reducing crop injury. Late-season first trap catch may be related to isolation of the crop in areas outside of commercial fruit production regions, e.g Herkimer and St. Lawrence Counties. More research on SWD management is needed to address optimal insecticide timings, crop diversification, landscape ecology, and effective cultural management tactics.

The quick reference tables of insecticides were distributed relatively frequently to growers and may prove to be a useful approach to disseminating this type of information from the Cornell Guidelines. Information and photos (Figure 3) posted on the SWD blog were used, with permission, for newspaper articles on SWD.

The group met to discuss plans for 2014 and possible ways to improve the trap network. The best available trap design should be used in all locations across NY to provide consistent and comparable results. It was suggested that screens rather than coffee filters might prove easier to use when servicing the traps to drain the SWD out of the drowning solution. Female SWD can be difficult to identify initially especially when hundreds of non-target fruit flies are also caught in the traps. Education on identifying SWD, SWD look-alikes, and commonly found fruit flies in NY will be offered in workshops in the spring before the SWD trapping season begins in 2014.

The NY trap network appears to have proven successful in accomplishing its primary goal of monitoring for first trap catch of SWD and disseminating information to growers. The results indicate that early warning of SWD presence is possible with monitoring in most locations.

SWD Online Resources

Spotted Wing Drosophila blog blogs.cornell.edu/swd1/

Spotted Wing Drosophila website www.fruit.cornell.edu/spottedwing/

Spotted Wing Drosophila Biology and Life Cycle
www.fruit.cornell.edu/spottedwing/bio.html

Spotted Wing Drosophila Crops of Concern and Wild Hosts
www.fruit.cornell.edu/spottedwing/cropshosts.html

Recognize Fruit Damage from Spotted Wing Drosophila
ir.library.oregonstate.edu/xmlui/bitstream/handle/1957/19525/em9021.pdf

Spotted Wing Drosophila Identification Guide
www.ipm.msu.edu/uploads/files/MSU-SWD-ID.pdf

Spotted Wing Drosophila Monitoring Traps
www.fruit.cornell.edu/spottedwing/pdfs/SWDTraps_CornellFruit.pdf